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INSTRUCTIONS ON

HORSE PACKING

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HORSE-PACKING

Introduction

Packing, as used here, means moving supplies, equipment and other material on animals. Of the total knowledge necessary to do a satisfactory job of packing, probably 90 per cent relates to the use and care of the pack animals, including feeding, watering, shoeing and the prevention of injuries. The other 10 per cent is knowing how best to assemble the material to be packed into pack loads, to place the load on the animal, and to make it secure with pack hitches. No one can be considered a good packer whose knowledge is limited to methods of assembling, placing and securing the load. He must also know how to take proper care of the stock.

Pack Animals

Kinds and Number in One Pack String

Horses and mules are commonly and satisfactorily used as pack animals. Mules are sure-footed, tough, steady and easily trained. They are good feed rustlers and can be relied upon to take care of themselves. They are often preferred to horses for steady and difficult packing jobs.

The ideal pack animal has a friendly disposition, is well-proportioned, well-muscled and agile, weighs 900 to 1000 pounds, and has a short back, medium low withers, a round barrel, round, up-standing feet and medium heavy bone. The animal that has a short, quick-walking stride will carry a pack load more easily than a long-gaited one, as its gait will rock and sway the pack less. The awkward, stumble-footed type of animal will have great difficulty under a pack in rough going, where the agile, sure-footed animal will travel with ease.

The number of pack animals one packer can successfully handle varies from five to nine head which, together with the riding animal, is referred to as a pack "string".

Care of Pack Animals

Aside from its natural strength and agility, the health and vigor of a pack animal will determine its normal capacity for carrying pack loads. Sore backs and improper feeding are the most common causes of lowered efficiency. The packer will make every reasonable effort to keep his pack string at a high level of efficiency and to prevent the animals from acquiring saddle sores, galls, lameness or any other affliction that would tend to reduce their normal fitness for the job.

Feeding

The packer will make sure that his horses and mules get enough of the proper feed and water to keep them in condition for the job, even

though it means much inconvenience to himself. An animal will usually do best if turned loose during the night. One that is tied up, either in a barn or outside, does not receive the maximum good from the rest period. An animal tied up during a cold night without the protection of a barn is at a great disadvantage, since it cannot move around and keep warm. Allowing the animal the freedom of a corral or pasture with access to plenty of good feed and water approaches the ideal for mild weather.

Horses or mules doing hard work should be given all the grass or hay they can eat. The rule for feeding hay is to give all the animal will clean up without unreasonable waste. When the animal is not working, a somewhat lighter feeding will do. Grain or grass hay is better for feeding horses or mules than alfalfa or clover, and hay that is free from weeds and other trash should be used whenever possible. Hay should be fed in mangers or feed racks whenever these are available, but it may be fed on the ground if necessary.

Grain is a rich feed and care should be exercised in its use, particularly when the animal is not accustomed to it. Too much grain will founder a horse, and even though it may not be fatal, it will frequently ruin the animal for any further use. Whole oats probably are the most popular grain for horses and mules, but rolled oats or rolled barley are commonly used. Oats are not as rich as barley or most other grains and somewhat larger quantities of them can be fed safely.

When getting an animal accustomed to grain a comparatively light feed should be given. Two to three quarts of oats daily is usually sufficient at the beginning after which the amount may be gradually increased to a full feed. A full feed of oats should not exceed three gallons a day when the animal is doing heavy work. If grain hay is fed, somewhat lighter feeds of grain are usually given, depending on the amount and quality of grain contained in the hay. Grain should be fed in nose bags or boxes or when necessary on canvas or blankets. It should never be fed directly on the ground. If an animal takes its grain too fast, one or two handfuls of chaff from the hay pile may be put into the nose bag or feed box, or a few rocks the size of one's fist may be put into the feed box.

General rules for feeding with hay and grain are as follows: (1) Water before feeding; (2) feed hay before grain; (3) feed in small quantities and often, at least three times a day if at all possible. After making camp in the afternoon or evening, feed one half the hay for that evening, following with grain in an hour or so, then feed the remainder of the hay before bedtime; (4) if noon feeding is possible, feed one fourth the grain ration in the morning, one fourth at noon, and one half at night. If not, feed about one third the ration in the morning and two thirds at night; (5) do not work the animals hard immediately after a full feed.

Horses or mules should be given salt (as much as they will take) frequently, especially when on green grass or when fed green hay.

Watering: Good, clean water is just as important to the saddle or pack horse's health as it is to man's. The best is none too good.

Pack animals will do best if allowed free access to available water during the night, with one or more drinks during the day as convenient. Where this is impractical, as a minimum the animals should be watered just before the packer retires at night and before beginning the trip in the morning. An overheated animal should not be watered until his condition has returned to near normal. If the animals are warm, it is good practice to allow them to drink about half the amount they want at some spot along the trail a few minutes travel from the destination, giving them the remainder after they have cooled off. The animals should always be allowed to drink before making a dangerous ford, as this will reduce the danger of their becoming entangled in the lead ropes while trying to drink. If the animals are watered while tied together, the packer should make sure that each gets a chance to drink. The tendency is for the animal in front to push forward as soon as it has finished and not allow those behind to drink.

Shoeing: Pack stock used in rocky country, or used continuously, should be shod at the beginning of the season and have their shoes reset regularly at about six weeks' intervals. A professional horse-shoer should do the regular shoeing and resetting. However, a shoe may be pulled on any trip, particularly if the stock is used in rocky country or in logs or mud. Such a shoe should be replaced at once to prevent the hoof from breaking. Before making extended trips into the back country, packers should be prepared to do such emergency shoeing as may be required. For this purpose, a light shoeing outfit, consisting of rasp, hoof knife, shoeing hammer and hoof nippers, should be carried. A small supply of the proper size horseshoe nails and one front and one hind shoe to fit each animal in the pack string should be carried. Ordinarily this will not mean two shoes for each animal, since often two or more animals will take the same size shoe. A "cold" shoe can be shaped without heating to take care of small differences in feet for emergency shoeing. Used shoes are satisfactory for this purpose and have the advantage of being the proper length. How to hold the foot to shape the hoof and to fit and nail the shoe should be learned from a qualified man before the job is attempted. The following suggestions will be of assistance:

Shaping the hoof: The bottom of the hoof should be rasped down level. This is accomplished by making the rasp bear on the outside shell at two points at the same time. Care should be used to insure that the outside shell is not rasped down so short as to expose the inside or tender part of the foot. The natural level of the foot should be maintained. This will require some practice, since there is a natural tendency to rasp the hoof down more at the back than at the toe. The inside part (not the frog) of the foot should be slightly cupped so that it will not bear on the shoe. This is done with the hoof knife. The outside shell should carry the entire weight.

Shaping the shoe: The shoe should be true so that it will bear evenly all around the outside shell without rocking. It should be only wide enough to be flush with the outside edge of the hoof all around. A shoe can be widened by spreading the points or narrowed by pounding them together. Care should be used not to twist the shoe, as it is extremely difficult to true up without a flat surface.

The natural tendency is to place the shoe too far back, which encourages rasping off the outside of hoof at the toe. A cardinal rule is "make the shoe fit the foot, not the foot fit the shoe". The outside shell should not be dubbed off even though the shoe placed on as an emergency job fails to reach the edge of the hoof (sometimes the extreme edge is cut on a 45° angle about 1/32 of an inch to prevent the hoof from "ravelling").

The shoe should be long enough to permit the points to cover the hoof at the heel without extending beyond. For emergency shoeing on the ordinary animal, no harm will result if the points extend up to one-half inch beyond the heel. However, the animal that "overreaches", that is, steps with his hind foot ahead of the front foot track while walking, may give trouble from pulling front shoes through stepping on the extended points with his hind feet. An animal that overreaches should be shod "close". The points should be wide enough to give ample clearance to the frog.

Nailing the shoe: The point of a horseshoe nail is beveled on one side to guide it out of the hoof. The guide bevel should face the inside of the foot to crowd the point outward. Approximately half the nail should come through, but because of the difference in the slope of the hoof the front nails tend to come out low down, and the back nails high up. This can be controlled somewhat by the angle at which the nail is started. If difficulty is had in getting the back nails to come out soon enough, the point of the nail can be slightly bent with the hammer claws to accentuate the bevel. When the nail has been driven about half way through, the point should be checked to be sure it is coming out at the proper place. It should be pulled and started over if coming out too high up, and in all cases should be pulled promptly if the animal flinches. Each nail should be bent over as soon as driven to reduce the danger of injury to the shoer. (Some prefer to twist the nail off with the hammer claws instead of bending it over). When all nails are driven in, they should be cut off close to the hoof. They are then tightened and clinched with a clinching block. (The face of the nippers is sometimes used). After clinching, rough edges are smoothed off with a rasp, and the points hammered down to lie close against the hoof.

Rocks or sticks may become lodged between the points of the shoe or between the frog and the shoe. If allowed to remain, they may cause lameness. They should be removed as soon as discovered. A small gravel will sometimes wedge between the shoe and the bottom of the hoof, and if allowed to remain may become imbedded and cause serious lameness. Any lameness or tendency of an animal to "favor" a foot should be investigated promptly to determine and remove the cause.

Useful publications on horseshoeing are, Farmers Bulletin No. 1535, "Farm Horseshoeing", and a training manual, "The Horseshoer", by the U. S. Army, 1926.

Hobbling and Picketing: There are several styles of commercial horse hobbles having a short length of chain with swivel joint in the middle and equipped with leather straps on either end for fastening around the horses ankles. When hobbles are necessary, the conventional type should be used except in emergencies. They should be placed below the fetlock to prevent bruising the leg tendons, and buckled only tight enough to keep them from slipping over the hoof. "Side bones" are often caused by tight hobbles. Ordinarily, hobbles are placed on the front legs only. In an emergency, a horse can be effectively hobbled with one strand of 3/4" or 1" manila rope about 6' long. Double the strand and tie the ends together with a simple knot. Place middle of doubled strand around right front foot and make two twists. Then place the ends of the doubled strand around the left front foot from opposite directions and pass the knot at the tied end of the doubled strand through the loop at the other end. Then wrap the knot end around one strand of the loop end and out between the two strands. This tie can be undone even when covered with mud and snow. The hobble can be used several times.

To picket a horse, attach the picket rope to a short stout peg at ground line and to the hobbles placed on one or both of the animal's front feet. A half hobble may be used, with the swivel to keep the rope from kinking. If no hobbles are available, the rope may be attached to one front foot. The picket rope should not be attached to the halter or the animal's neck because of the danger of the animal becoming tangled in the rope and "hanging" itself or getting severe rope burns. Picketing is a last resort.

Tying up: When tying an animal up, the knot should be made so it will not come untied or loosen and permit the rope to slide down the hitching post or tree, letting the animal get its foot over it. It is good practice to use two full wraps around the hitching post to prevent downward slipping, and to place the end of the rope through the loop, if a bow knot is used, to prevent its coming untied. Ordinarily, the tie on the hitching post is about 40 inches above the ground and the amount of freedom allowed an animal is about 40 inches. For the average animal the length of tie should barely keep the lead rope from touching the ground when the animal puts its head down. A longer tie than this will increase the danger of its getting its foot across it.

Care of teeth: It is good practice to have an animal's teeth examined and treated periodically by a qualified veterinarian. Normally this need not be done oftener than once a year. Frequently, such a checkup will reveal defects in the animal's teeth which can be corrected before ill health results. Where the services of a veternarian are not readily available, the common practice is to observe the general health of the animal and have the teeth examined and treated only when there is some outward sign of defective teeth such as abnormal loss of flesh, tendency to drool, or difficulty in eating. Any unusual loss of flesh, drooling, or difficulty in eating warrants an examination to discover the cause. The professional veterinarian will often discover the cause when it is not clear to the layman.

Care of Backs: The condition of a pack animal's back is particularly important, because the fitness of the animal to do the job largely depends upon it. The back is frequently a source of trouble to the careless or the inexperienced packer, as it will become sore unless properly cared for. The same is true of the parts where the cinches, cinch rings and latigoes work. Sores are much easier to prevent than to cure, and for this reason the packer should keep prevention uppermost in his mind. Sores are caused by chafing, scalding, or gouging and are referred to as "saddle sores", "ring sores", "kidney sores", "cinch sores" or "galls". There are several good practices which will help prevent them:

1. Breaking in: A sufficient period should be allowed for gradually toughening the back when the animal is first placed in use following a long lay-off. Extreme care should be used during this period to prevent the development of sores before the back is thoroughly conditioned. The first trips made should be short with light loads. Care should be used not to get the animal too hot during this period, since steam makes the back more tender and more susceptible to scalding and blistering. Especially during this period, the animal's back and sides should be carefully looked over as soon as the saddle has been removed to detect the first signs of soreness. Places where the hair is slicked down, lumps, or chafed spots are all indications of pressure spots which should be massaged with the hands or a brush immediately to stimulate circulation. A similar examination for the same purpose should be made of the animal's back and sides before saddling. Feeling with the fingers may reveal a small bump (half the size of a pea) which may be the beginning of a blister. A wet spot on the back in the morning may mean a chafed spot and swelling may mean a bruise. In each case, examine the saddle blanket or other articles to determine and remove the cause.

Washing the back and sides with a moderately strong solution of either salt or alum and water after removing the saddle will help to toughen the animal's skin where the saddle and cinches work. If sores do get started, treatment of them should start as soon as possible. A good gall cure applied according to directions on the container helps, but it is just as important to make sure the sore is not further aggravated by the saddle or rigging during the healing process. Correct the cause of the sore.

Galls, hobble burns, and rope burns should be kept soft with grease. Application of salty bacon grease or butter will frequently prevent the hair from turning white on galled spots.

2. Keep backs clean: Use vigorously a stiff brush, with or without curry comb, before saddling, to remove dust, dirt, and sweat deposits.

3. Keep saddle blankets clean: Select a suitable type blanket (see saddle blankets) and keep it washed free from dirt, hair and sweat deposits. A saddle blanket should ordinarily be cleaned thoroughly with a brush and soap and water at intervals of at least 6 to 10 days. Blankets should be dried before using.

4. Adjust rigging properly: The proper adjustment of saddle (see "Rigging" under "Packsaddles") is important in the prevention of sore backs because when properly adjusted, the saddle is held in the correct position for the animal to carry the load without injury. The outfit should be carefully fitted to the animal and the same outfit should be used on the same animal all the time to insure well-fitted gear.

5. Keep pack loads balanced: This is probably the most important single item in the prevention of sore backs. A balanced pack load evenly distributes the pressure on the back through the saddle bars, permitting them to rest evenly on the back muscles. An unbalanced pack load tends to rotate the saddle toward the heavy side, placing the animal under a strain and developing pressure spots under the saddle bars or elsewhere, which result in sores.

To the experienced packer there are several telltale signs to indicate when a pack load is not riding properly. For example, an animal that is being subjected to pain from pressure points developing under an unbalanced or otherwise improperly placed pack load will often "crowd" one side of the trail, travel sidewise, crowd the animal in front, kick, "wring" his tail, throw his head, or otherwise give signs that something is wrong. (A mule will frequently lie down or "balk"). Any such unusual actions of a pack animal should be investigated at once to determine and remove the cause.

On the trail, when a pack begins to slip, it should be readjusted as soon as discovered without waiting for a better place, for carrying an unbalanced load for even a short way when the back is hot and sweaty may start a sore. A pack can be more easily adjusted if the animal is facing slightly downhill. The animal should be untied and taken out of the string before adjustment of the pack begins.

Saddling: In preparing to saddle the average animal, it is best to untie it and either hold the lead rope in one hand or place it over the left arm where it can be grasped readily while the blanket and saddle are put on. A saddle or pack animal should never be tightly cinched while tied by the head unless it is definitely known that it is agreeable to such treatment. If an animal is the least bit "touchy" about being cinched, it is very likely to pull back if tied and may become a habitual "puller".

It is good practice to place the blanket slightly forward of the proper position and slide it backward into place to make the hair lie down. The blanket should be centered over the back sidewise and should extend at least two inches ahead and behind the edges of the saddle skirts on a riding saddle and at least twice this much (more is better behind) under a pack saddle. The blanket should extend at least two inches behond the rigging rings on the side. After the saddle is in place, the blanket should be pulled well up into the saddle fork to allow plenty of room for the withers when the saddle bars are pressed into place by cinching and the weight of the load. This will allow air circulation after loading as well as prevent pinching the withers.

The saddle should be so placed that the curve of the saddle bars will fit smoothly into the natural curve of the animal's back. To compensate for the pull-down when tightening the cinches, it is good practice to set the saddle slightly on the "off" side at the start. It should be centered sidewise over the backbone when properly tightened. Having the pack saddle centered is a real aid to gauging the balance of the pack load, in addition to the fact that it must be centered to properly carry the load on the back muscles.

Ordinarily, the cinches should not be completely tightened when the saddle is first put on. If necessary to complete the operation hurriedly, as is sometimes the case with a saddle horse, it is best to pull the cinches snug, then turn the animal around and complete cinching. After cinching is completed, the animal should be led a few steps before mounting. This gives it a chance to adjust gradually to the feel of the cinches.

The usual custom with a pack string is to pull the cinches on each animal just tight enough to hold the saddle in place at time of saddling, leaving them until all packloads are made up and ready to load; then to tighten the cinches on each animal as it is led out to be loaded. If a double cinch is used the back one should not be pulled as tight as the front one.

The purpose of the cinch is to hold the saddle in place and it should not be pulled tighter than is necessary to do the job. With properly balanced pack loads, the cinches do not need to be extremely tight, but they should remain comfortably snug after the pack loads are on and the saddle bars pressed into place. A little practice will indicate the proper amount of tightening for each animal. Oftentimes an animal that is cinched too tight will groan or lie down. Cinching too tight during the "break-in" period or when the animal is tender may result in making it a "cinch-binder" and difficult to manage for the rest of its life. On the other hand, the "wise" animal may fool the inexperienced man by expanding and making the cinches appear tighter than they really are. One method experienced packers use to overcome this trick is to pull the latigoes tight but leaving them untied, go on about the business of packing until the animal relaxes, then suddenly complete the tightening before the animal can again get set.

Although the saddle bars of a properly made saddle are shaped to fit smoothly into the curve of an animal's back, occasionally the back of an individual animal will be found to vary from the normal. Such variations must be provided for by some adaptation that will permit the animal's back muscles to support the loaded saddle bars without creating small pressure spots that will make sores. A "rocker," or padding material folded so as to have tapered edges fore and aft, is used to adapt the normal saddle bar to the animal that is slightly "sway-backed" or has unusually high withers. When used, the rocker needs to be carefully fitted and placed at each saddling.

Pack Equipment

Pack equipment includes the pack saddles, with necessary ropes, canvas, bags, blankets, pads and other articles necessary to secure and protect the load for moving. The equipment needed for ordinary loads only will be treated. No attempt will be made to list special equipment such as that needed to pack lumber, poles, or other unwieldy articles.

Pack Saddles

In general, pack saddles may be divided into two types, the Decker and the crosstree (sawbuck). Both types are in common use and each has certain advantages for specific purposes.

The Decker: (See pages Q1 and Q2, Fire Control Equipment Handbook, for illustrations and additional description). The Decker packsaddle is designed specifically for "cargo" packing. It consists of cottonwood saddle bars fastened together with iron tree forks, which form loops to which the "cargoed" (see "cargoing") loads can be quickly fastened with the Decker tie (see figures 6 to 9). It is unexcelled for "cargo" packing, and should be used whenever available for moving material that can be packed in manta-wrapped packages or without wrapping.

When the Decker saddle is used, it is customary to fit the tree to the animal that is to carry it. This is done by placing the bare tree on the back, observing the spots that "bind" or "ride", then reducing the tree with a wood rasp until the wood matches the back as nearly as possible.

Crosstree (or sawbuck): (See page Q2, Fire Control Equipment Handbook for additional illustration and description). Usually the crosstree type packsaddle consists of cottonwood saddle bars fastened together with hardwood tree forks which cross (hence the name crosstree) to form convenient places to hang the alforja loops, or to which cargoed packages can be secured with swing ropes. The crosstree packsaddle is made in at least two sizes, the smaller for use on small horses and mules and the larger, or more common size, for use on the normal size animal. The saddle should properly fit the animal's back.

Rigging: Under this heading is included equipment such as breeching, breast collars, cinches, and side pads, which are attached directly to the packsaddle either to hold the saddle in place or to protect the animal from the packload.

Breeching: The breeching assembly consists of a breeching band with straps to secure and attach it to the packsaddle tree and rigging or cinch ring (see figure 6). Its purpose is to hold the saddle in place from the rear. Several types of breeching are in use, but a type that has a low "draft" is best for exceptionally steep country, since it prevents the breeching band from working up under the tail. Low draft types have lower

hold-back straps which attach either to the back cinch ring, as used on the Decker saddle (see figure 6), or to martingale connecting to the breast collar, as used on the Britten crosstree pack rig.

The breeching band is commonly made of cotton webbing, but leather is best as it has the advantages of less stretch, less tendency to rub off hair or chafe, and is easier to keep clean.

Breeching should be correctly adjusted and kept in place. When properly adjusted, the top edge of the breeching will be about three inches below the point of the buttocks. All hold-back straps should be snug without tension when the animal is in motion on the level. If the adjustment of the breeching is too loose, it will allow the saddle to slip too far forward, raising the front end and permitting the load to rest on the withers and rear ends of the saddle bars. This is a common cause of kidney sores. If the adjustment is too tight, it will hold the saddle too far back and cause the weight to be carried too far back on the animal, causing sores under the pressure area.

Breast collars: The breast collar assembly, to hold the saddle in place from the front, consists of a breast collar band and straps to attach it to the saddle (see figure 6). The type having a low draft, or with a lower strap which attaches to the rigging ring, as used on the Decker saddle (see figure 6), is considered better than the type that attaches only to the saddle fork (see figure 10), unless the band is used with a martingale as on the Britten pack rig. Breast collar bands are made of either cotton webbing or leather but the latter is the best.

Correct adjustment of the breast collar is essential. The band and hold-back straps should be snug, without tension when the animal is in motion on the level. If the adjustment is too tight, it will have a tendency to choke the animal and restrict its breathing in going uphill, unless of the type used with martingale, and to hold the saddle too far forward. If too loose, it will allow the saddle to work far back, causing the same effect as a breeching adjustment that is too tight.

Cinches: Hair, mohair, cotton web, cotton fish cord, cotton strand, and leather are used for saddle cinches. Lash cinches and the back cinch of a double-rigged packsaddle are usually of the cotton web type, but occasionally a back cinch of leather is used. Frequently the front cinch of a double-rigged packsaddle is also of cotton web, but it is good practice to use a hair, mohair, or other strong cinch for this purpose. Cinches on single-rigged packsaddles are usually of hair or mohair, but any good cinch may be used. A smoothly-folded burlap sack makes a good emergency cinch.

Cinches are usually attached to the packsaddle with latigoes on both sides. They should be adjusted so that when properly tightened the distance between the rigging and cinch ring is equal on both sides. For easy cinching, latigoes should be kept soft and pliable with neatsfood oil.

The Decker packsaddle characteristically is equipped with but one cinch, usually of good grade hair or mohair. The single cinch is essential to secure the maximum advantages from this type saddle.

Crosstree packsaddles are both single and double rigged. Those with two cinches are considered best for most uses, because the two cinches give better control of the saddle by bringing the draft nearer the ends of the saddle bars and provides space for the lash cinch between them without overlapping.

Lash cinches are equipped with a ring in one end and an iron or wood hook in the other. Some packers prefer the wood hook on the grounds that it better holds the rope from slipping.

Side Pads: The side pad, called the aparejo pad on the Decker, is used to protect the animal when cargoed loads are carried. Since the Decker packsaddle is specifically designed for cargo packing, the aparejo pad is standard equipment on it. The pad is placed over the packsaddle tree with the iron saddle forks and saddle rigging extending through splits made for that purpose (see figure 6). The Decker aparejo pad extends about 5 or 6 inches below the rigging ring and has a wooden slat along its lower edge on either side of the horse. The cargoed package rides on the pad and the animal is protected against chafing or rubbing.

The Decker aparejo pad is usually stuffed with deer hair if available. Stuffing should be done when the rigging is first fitted to the animal; it is just as important as fitting the tree. The filler can be adjusted when necessary to remove the pressure from sore spots or bumps. Bear grass is good stuffing material. To make it "springy" handfuls may be knotted while green and the knots untied after the grass has been dried in the sun.

Side pads similar to the Decker aparejo pad and made with pockets into which grass or other padding can be placed can be had to equip crosstree saddles when they are used for cargo packing. Side pads are essential to protect the animal when carrying lumber or other hard or packaged loads that are likely to cause injury. Padding such as blankets or straw in alforjas or grain sacks are sometimes placed on the sides to furnish this protection when regular side pads are not available.

Blankets: A good blanket under the packsaddle is very important. It should have the following qualities:

1. Be easy to clean
2. Be reasonably porous to allow circulation of air
3. Present a smooth surface to the animal's back, or be free from seams, wrinkles and bumps.
4. Have sufficient body so it will not roll or wrinkle in use.
5. Should wear well

The Navajo rug type meets these specifications admirably, but is too costly for common use. A satisfactory, thick, specially-woven wool saddle blanket can be obtained. The common wool bed blanket tends to wrinkle or roll and is not considered satisfactory. A saddle pad is used on top of the blanket to give sufficient cushion for packing. The common deerhair pad is suitable, but some packers prefer horsehair. Whichever type is used, it should be of sufficient size to extend well beyond the ends of the saddle bars, and underneath the rigging ring. The total thickness of the pad and blanket is important. They should be thick enough to properly cushion the saddle bars for the loads carried, but not so thick as to pinch the withers between the forks of the saddle when the bars are pressed into place by the weight of the pack load. A blanket that is too thick is just as serious as one which fails to properly cushion the saddle bars.

A special deer hair pad has been developed and can be obtained for use with the Decker packsaddle. The side to be placed next to the animal is covered with heavy ticking. The pad sheds water, instead of absorbing it, and is easy to clean. When this pad is used, a blanket is not necessary.

Pack Covers: The large pack cover is made of good grade canvas, size 6' x 12', with grommets in corners and center of each side. For use as a pack cover on a crosstree saddle with top pack, it is doubled and placed over the top of the pack load to protect it from dust, dirt, and weather. In camp it may be used as camp shelter, to protect riding and packing gear from weather, and to place between beds and the ground.

Cargo Manta: The canvas used to enclose the items making up the side packs for cargo packing is known as a cargo manta (or mannie). It is a small-size pack cover, 6' x 7', made of good grade duck and often without hems or grommets. It can be used as a pack cover.

Lash and swing ropes: A lash rope is used with a lash cinch to secure the top pack on a crosstree and hold the load securely to the horse. It should be 35 to 40 feet in length and preferably of 5/8 inch diameter manila. Smaller sizes are frequently used, but the 5/8 inch size has the advantages of having less stretch, cutting into the pack load less deeply, being easier on the hands, holding better when lock hitches are used, and wearing longer. A soft, pliable rope is much better than a hard, stiff one.

Swing ropes are used in cargo packing. They are also used to support the side packs where alforjas are not available or not suitable for the load, but there is a top pack secured with a lash rope. As a top pack is very seldom if ever carried on a Decker packsaddle, the only ropes used to secure the cargo are two swing ropes, one on each side. Each rope should be at least 26 feet long, and preferably of 5/8 inch manila. One end of each rope is attached to the front saddle fork by means of a spliced eye through

which the other end is run. For cargo packing with a crosstree packsaddle, a swing rope 40 to 50 feet long is attached to the front crosstree with a clove hitch in such manner that one-half its length falls on either side of the animal. A single, shorter and smaller size rope, or two short ropes, may be used if there is a top pack secured with a lash rope.

Halters and lead ropes: Good grade leather halters are most commonly used in pack strings, but several types of cotton rope halters are satisfactory for gentle animals. A heavy halter has been designed primarily for use on mules and should be used when available. It has a leather draw feature which does not pinch the animal's nose but is very effective to cure one that drags along with a tight rope. Lead ropes made of 5/8 inch or ½ inch manila are most commonly used, either with or without a snap spliced in one end. For pack animals that are not entirely gentle, use of the ropes without the snaps is recommended. Lead ropes of 5/8 inch or 3/4 inch three-ply twisted cotton are also satisfactory, but are more costly than the manila.

Care of Equipment

Packing equipment should be maintained in good condition so as to insure long life of the equipment and to minimize delays in transportation due to equipment failure. It should be properly protected from sun, rain, rodents and weather when not on the stock, leather parts should be properly oiled, canvas should be dried and kept free from mildew, and all needed repairs should be promptly made (see page 3-24, Fire Control Equipment Handbook on care of leather and canvas goods).

Annual Overhaul

All pack rigging, both leather and canvas, should be overhauled annually at the close of the packing season. All worn or unserviceable straps should be repaired or replaced before oiling or other treatment preparatory to winter storage. Canvas goods should be patched as needed. In winter storage, the equipment should be arranged in an orderly manner and protected from damage by the weather and rodents. Complete overhaul in the fall or early winter will insure that the equipment will be ready for use whenever needed.

Current Maintenance

One of the packer's important jobs throughout the packing season is to prevent damage to equipment and keep it repaired. Broken straps, snaps and buckles or other parts should be replaced or repaired as quickly as possible. For this purpose, the packer should carry a small supply of lace leather, copper rivets, strap leather, buckles, and snaps. Straps or latigoes which may need occasional replacement should be laced on instead of riveted.

Lash, manta, and swing ropes should be kept out of the dirt as much as possible and should be kept in the dry when not in use. If they become wet while packing, they should be dried promptly. Ropes can be kept pliable in wet weather by a light application of boiled linseed oil. This treatment is recommended only for very wet climates or seasons, since oiled ropes soil the pack covers and are dirty to handle, but it will prevent them from taking up excessive moisture. Ordinarily, lash ropes should be re-coiled immediately after the packs are removed.

Packing

Organizing the Material

The key step in making ready to move material by pack train is to organize the "plunder" and arrange it into suitable and properly balanced pack loads. The packer should effect the best possible combination of the articles, so that one will not damage another, and give special attention to selecting those items which will make up into well-formed complementary side or cargo packs.

Cargo-Packing (Cargoing)

Cargo-packing is defined as the moving by pack animal, material (supplies or equipment) either wrapped and tied in canvas or large items which can be secured directly on the packsaddle without requiring the canvas wrapping but essentially without the use of alforjas. This method of packing is much faster and more satisfactory than alforja packing for moving most kinds of supplies and equipment. It reaches its highest efficiency when the items to be packed require no packaging and when the total load is to be put on at one starting point and delivered at one receiving point. These conditions prevail on many of our back country fires, which entail the moving of quantities of fire equipment and supplies from the road to the fire camp. Much of our fire equipment and supplies is or can be packaged in strong containers, and no special packaging is required for such of these containers as will make suitable side packs. Many other articles, as well as most food supplies bought in quantities, come in packages that are easily made up into manta-wrapped units suitable for packing by this method. Anything that can be boxed, packaged or placed in bundles or large items can be cargoed. A miscellaneous assortment of small items should be arranged in paper cartons or wooden boxes before wrapping in the manta for cargoing. The method of enclosing the load and tying up the package is shown in figures 1 to 5.

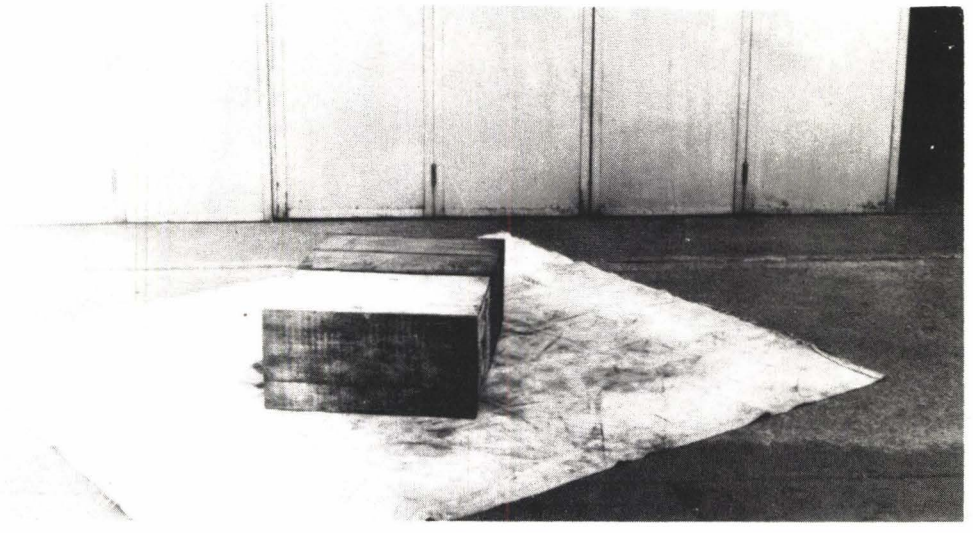


Fig. 1
Placing Load on Manta

Step 1: Place side-pack load in center of canvas manta, arranging the load on the diagonal. The manta shown in figure 1 is a small, good grade, canvas pack cover, size 6 x 7 feet.

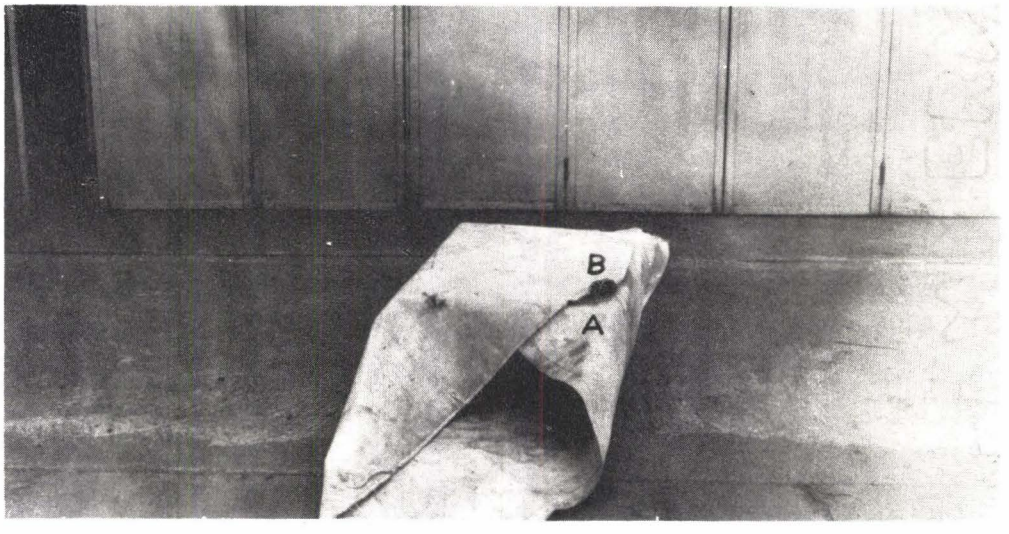


Fig. 2
First Two Manta Folds

Step 2: Bring the "near" manta corner, shown at A, tightly across packload from the side. Fold corner under so that it will just cover face of load. Hold in place with knees.

Step 3: Bring opposite manta corner, shown at B, tightly across packload from opposite side. Fold corner under so the folded edge will face on near side of load as shown. Hold in place with right knee.

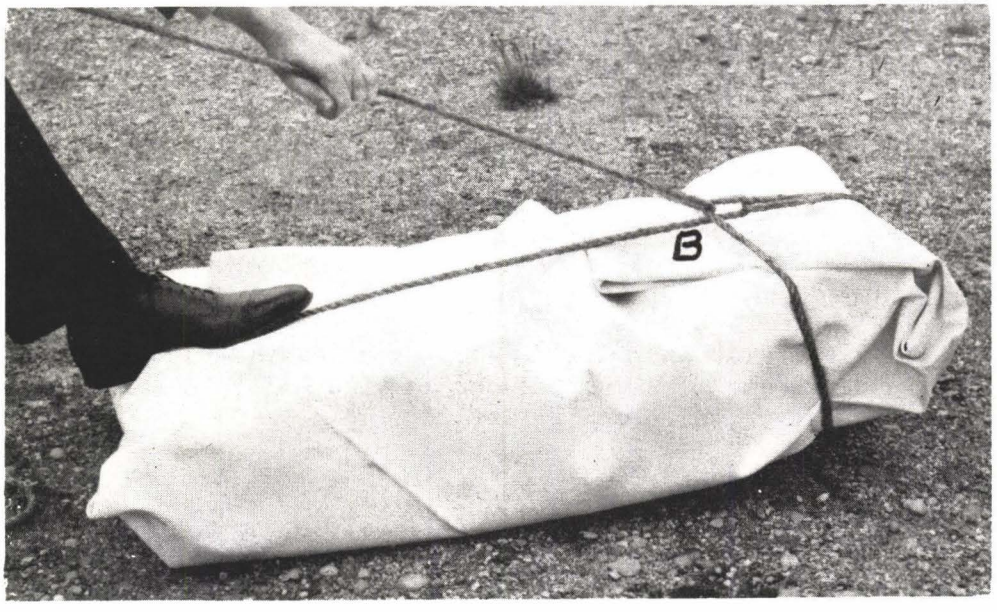


Fig. 3
Folded Manta and Start of Manta Tie

Step 4: Bring manta corner B over top end of packload, folding extreme corner under as shown. Hold in place with knees.

Step 5: Place slip-noose end of manta rope around cargo lengthwise. Adjust so honda, or loop, will be near upper end of cargo when tightened.

Step 6: Take half-hitch around cargo, and tighten (this also tightens the loop). Take a second half-hitch around lower end as shown in figure 4.

Fig. 4
Half-Hitches Around Cargo

Step 7: Bring running end of manta rope tightly lengthwise around middle of cargo as shown in figure 4. Pass rope under half-hitch nearest upper end and complete tie as shown in figure 5.

Fig. 5
Completed Cargo Tie

The manta tie-up rope shown is 3/8" manila rope 20 feet in length and is the proper size and length for the usual cargo. The upper end of the side in view is the top end of the load and is placed towards the animal.

Alforja Packing

In this type of animal packing, the side packs are contained in alforjas or pack bags, hung on a crosstree packsaddle, usually supplemented with a top pack and secured with a lash rope. It is suitable for the type of loads that are made up of a miscellaneous assortment of items such as a camp outfit consisting of cooking utensils, food supplies, bedding and personal items. The alforjas offer a convenient place to enclose, hold and store the small items of food supplies and cooking utensils to facilitate placing them on a pack animal.

Alforjas are made in various styles and sizes. The alforja which is standard in the Forest Service is about 12x26x17 inches, made of medium texture canvas with leather ends and reinforcings (see page Q3, F.C. Equip. Handbook). Each bag is equipped with two sling or hanger straps for slipping over the crosstree packsaddle forks, a flap to cover the top, and straps encircling the entire bag to support the load and hold the bag closed. It is good practice to use a wooden box in at least one alforja to protect the type of articles that otherwise might be bent, broken or spilled.

Weight of Loads

A load of 200 to 250 pounds per animal is accepted as a standard size load for good animals for average trips in normal country. Lighter loads are carried when "breaking-in" the pack string, for fast or long trips, or over steep rough trails. Loads of 300 pounds per animal can be packed for shorter distances when the going is good or in emergencies. Best results in keeping the animals in good condition, particularly for steady packing where the feed is scarce, will be had by carrying standard sized loads.

Balance of Load

Probably the most important single item in packing is to make sure the total packload is properly balanced.

To achieve a balanced load, the packer carefully selects the articles that are to make up the cargoed side packs or the loads that go in the alforjas so they will be of equal weight or a difference of not over two to three pounds. Equal size also helps. Some packers weigh the side pack loads with scales, but the usual practice is to judge the comparative weights by lifting. With practice this can be judged to within the required limits. When top packs are carried, care must be used to see that placement of the articles in it is such that it will not upset the balance attained in the side packs. After the complete load is in place, the final check is usually made by lifting one side so as to make it rock sidwise and noting whether or not it rides free or tends to settle on one side. The experienced packer will not leave the starting place until he is certain all the packs are properly balanced.

Loading and Unloading

The position of the load on the animal is very important. The load should have its center of gravity well below the back line, but not more than halfway down the animal's sides. The load that rides well below the back line has less tendency to "rock" and gives the animal better control of it, especially when making quick moves in crossing logs or steep-sided ravines. This should be kept in mind when making up the packs. Heavy articles should always be placed low in the cargoed packages or in the alforjas. Hanger straps on alforjas should be adjustable to permit raising or lowering to properly place the center of gravity for different type loads. The side of the alforja should normally be about vertical or with only a slight inward tilt at the top.

Cameras, transits, or other delicate or fragile articles can be given the best protection against damage by placing them in the center of the pack. They should be well cushioned with bedding or other suitable padding material. Cooking utensils or other articles that are likely to rattle should be wedged or padded to prevent noise.

It is good practice to make up in advance all cargo or alforja pack loads and arrange the complementary side packs a few feet apart in a convenient location to be loaded on the animal. Everything should be made ready for an immediate start as soon after the animals are loaded as possible. The length of time any animal should be required to stand under load should be reduced to the minimum. This applies both to loading and unloading but is especially important at the start.

Generally, an animal should be untied while it is being packed, since many animals will pull back during this procedure if tied by the head. The usual practice is to lead the animal in between the two side packs. The packer retains control of the animal by either holding the lead rope in one hand or dropping it over his arm where it can be easily grasped if necessary. If there is a helper, he usually works on the "off" side while the packer remains on the "near" side. In putting on the pack, care should be used to make sure that no part of the pack load will rub, chafe, or gouge the animal.

Usually the "off" side pack is put on first, but both side packs should be put on as near the same time as possible, to relieve the animal from the necessity of standing under an unbalanced load and to reduce the danger of the saddle being pulled out of position. When two men are loading alforjas, both bags are lifted at the same time. The man on the "near" side places the hanger straps over the tree forks for his partner and vice versa. Top pack material is put on from the "near" side.

Hitches

Decker tie (or swing hitch): Some variations are in use for lashing cargoed packages to the Decker packsaddle, but the approved tie is shown and described in figures 6 to 9. (Note: The same tie may be used in cargo-packing on the crosstree saddle when a top pack or lash rope is not used. The swing hitch used on a crosstree saddle, where side packs are swung as a substitute for alforjas and where a top pack and lash rope are used, may be tied the same as steps one to three of the Decker tie shown except that bight R shown in figure 8 is used usually to make a clove-hitch in loop P either with or without the ends of the two swing ropes tied together over the top.)

Fig. 6
Decker Packsaddle

A. One type of halter-rope tie using two complete wraps around hitchpost and single-bow knot with end through bow to prevent coming untied. A clove-hitch is also commonly used in place of the one shown. A sapling 3 or 4 inches in diameter would be better as a hitching post than the small one shown. The tie at A should be about 40" above the ground.

B. The halter rope shown at B is ½" manila 9 feet long and tied into halter ring at C. The length of rope between ties at A and C or the amount of freedom allowed is about 40 inches (or equal to the height of A above the ground).

D. Breast collar band of leather equipped with snap and ring fastener. A good type.

E. Two "near" breast collar hold-back straps. The upper attaches to the saddle near fork, and the lower attaches to the rigging ring M. This style breast collar has a low "draft."

F. Aparejo pad to protect the animal from the packload.

G. Saddle pad used to cushion load under saddle bars.

H. "Near" top breeching hold-back strap. Attaches to saddle bar.

I. Breeching band of leather.

J. Two "near" side hold-back straps on breeching. Upper one attaches to rigging ring, lower one attaches to cinch ring. This style breeching has a low "draft."

K. Cinch. Decker saddles characteristically have but one cinch as shown. The cinch shown is 20-strand horsehair.

L. Cinch ring.

M. Rigging ring (single cinch in center-fire position).

N. A latigo tie on cinch ring. Tying at the cinch ring instead of the rigging ring is sometimes preferred to permit tightening the cinch without removing the pack load.

O. End of "near" swing rope with spliced eye. Rope shown is 5/8" manila, 26 feet long.

P. "Near" swing rope showing loop ready to be placed around the packload.

Q. Free or running end of "near" swing rope showing it through the rear iron saddle fork ring passing from the outside to the inside and under loop P.

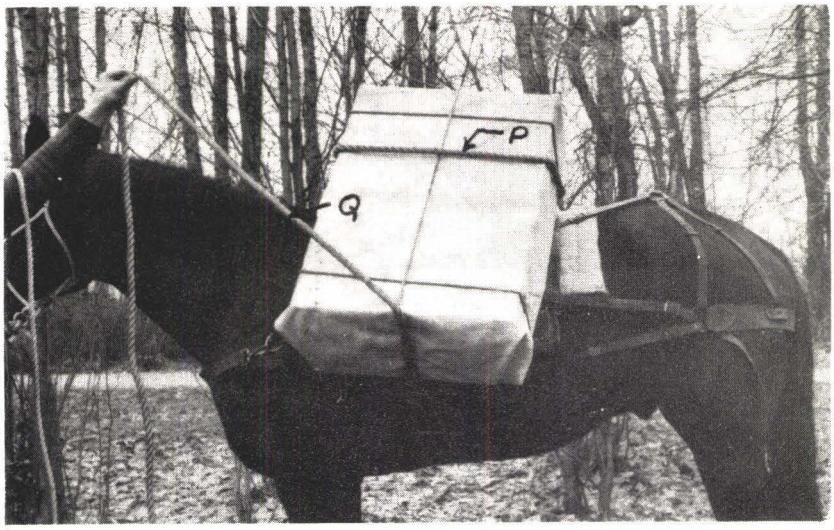


Fig. 7
Starting Decker Tie

Step 1: Lift manta-wrapped load into position (folded side toward animal with manta tie at top) and place loop of swing rope shown at P in both figures 6 and 7 around upper end of load. Pull loop tight.

Step 2: Bring running end Q up under middle of bottom end of pack-load as shown.

Note: The usual practice in packing is to place the two complementary side packs a few feet apart in the location to be loaded. Lead the pack animal between the two loads and place first the "off" side pack and then the "near" side pack on it.

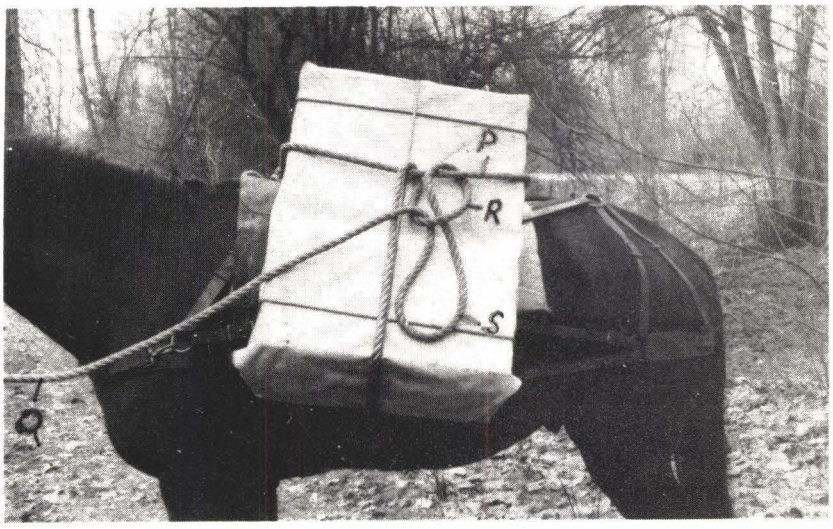


Fig. 8
Steps 3 and 4 of Decker Tie

Step 3: Tuck bight R of running end Q over and under loop P and adjust the height of the load.

Step 4: Tuck bight S of running end Q through bight R.

Fig. 9
Step 5 Complete Decker Tie

Step 5: Tighten bight R to complete as shown in figure 9 and tuck in loose end of rope. No additional ties, hitches or lash ropes are necessary or desirable for the Decker method of packing, except for a few large items of unusual shape. (Note: The canvas manta has not been properly placed on this load. See figure 5 for correct manta wrapped and tied cargo load.

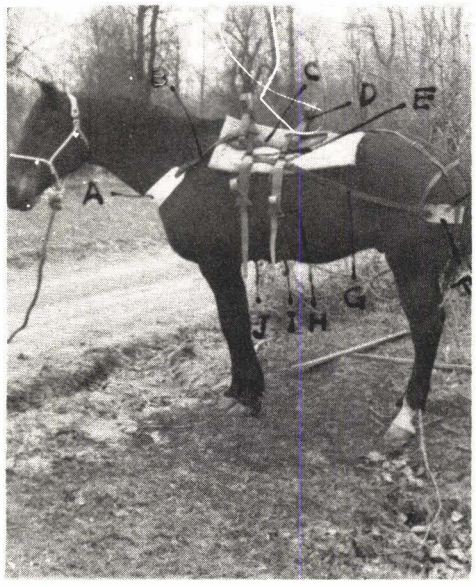


Fig. 10
Crosstree (Sawbuck) Saddle

A. Breast collar band (cotton web).

B. Breast collar "near" hold-back strap. (This type has only one hold-back strap on each side, which attaches to the saddle tree.)

C. Saddle bar.

D. "Crosstree" rear saddle fork.

E. Rigging rings

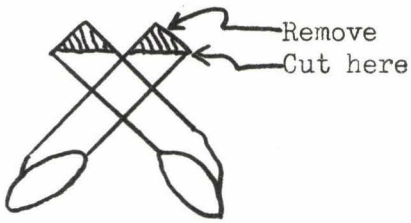
F. Breeching band (cotton web).

G. "Near" breeching hold-back strap.

H. A method of tying latigo on cinch ring.

I. Rear cinch (usually cotton web).

J. Front cinch (usually cotton web, but the one shown is 20-strand horsehair. It is good practice to use hair, fish cord or cotton strand.)



Some prefer to cut the points off the crosstree packsaddle forks as indicated in the sketch. A few manufacturers make them that way but commonly they are made as shown in figure 10. The "dehorned" variety is more convenient for use when wide, flat articles are included in the top pack.

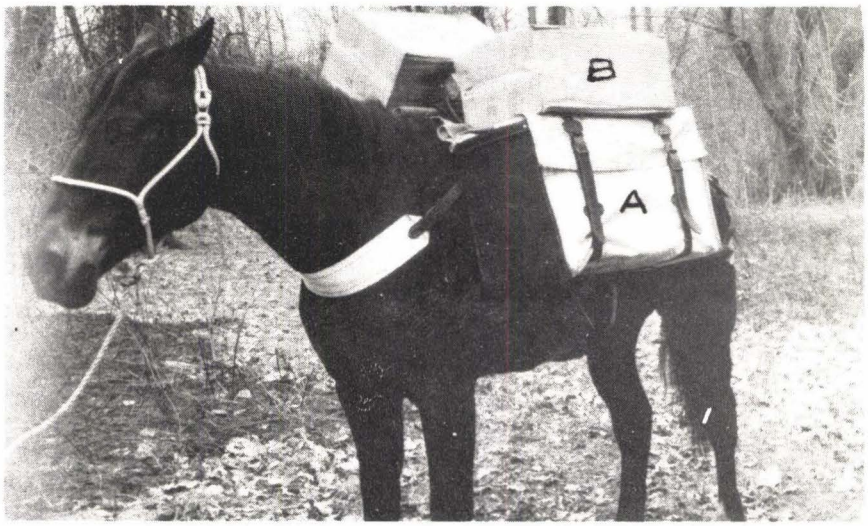


Fig. 11
Beginning Top Pack on Alforjas

Alforja or pack bag, shown at A, made of heavy canvas with leather ends.

Flat articles, such as shown at B, or other type articles that will stay in place are suitable for building on alforjas to make an even base for balance of top pack.

Diamond hitch: There are innumerable pack hitches in use for lashing pack loads containing top packs, usually in connection with crosstree packsaddles. The single (or one-man) Diamond hitch has been widely used and is known to be satisfactory for most top-pack loads. Many methods of throwing the single diamond hitch are used, but the one shown and described in figures 12 to 17 is generally accepted among diamond-hitch users. With a little practice it can be quickly and easily put on and taken off by a few simple motions.

Fig. 12
Beginning Diamond Hitch

Step 1: Lay bight of lash rope lengthwise over top middle of pack with about 1/3 of its length together with the running (free) end A to the rear of pack as shown.

Step 2: With lash rope tied solid in ring end, throw lash cinch C crosswise from "near" side over center of pack load (over running end A) to "off" side as shown with open side of hook facing back. (Note: Pack cover would normally be folded up under and in at corners. It was pulled low to cover up straps and rigging which might be confusing.

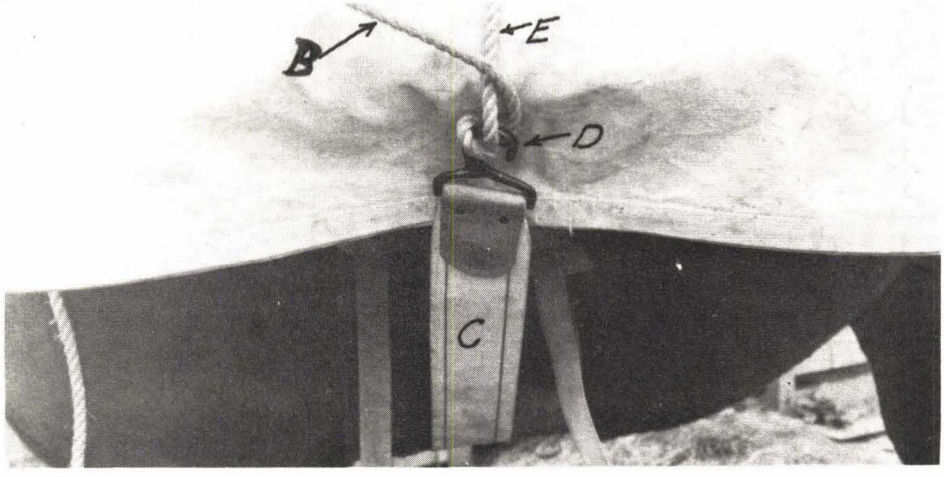


Fig. 13
Cinch Hook Tie

Step 3: Bring lash cinch C to "near" side with open side of hook O facing back. With loop end B (see figure 13) toward the left place half-hitch on hook so that rope E (going over pack load) passes from the outside to the inside of hook as shown. Make second wrap through cinch hook. (This tie is frequently made by passing rope E once through the hook going from the inside to the outside of the hook. Other ties are also used.)

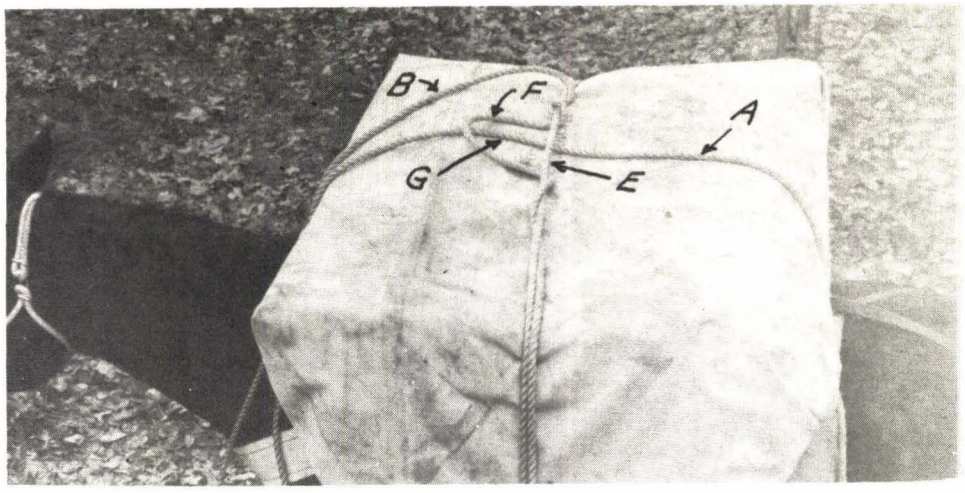


Fig. 14
Top-wraps

Step 4: Bring rope B in figure 14 to top center of packload to lie parallel to rope E. Tuck bight of rope B twice under rope E at top center of load, passing from the back to the front to form loop at F on front side of rope E in such a manner that rope A lies under center of loop F as shown. Tighten lash cinch and run slack into loop F.

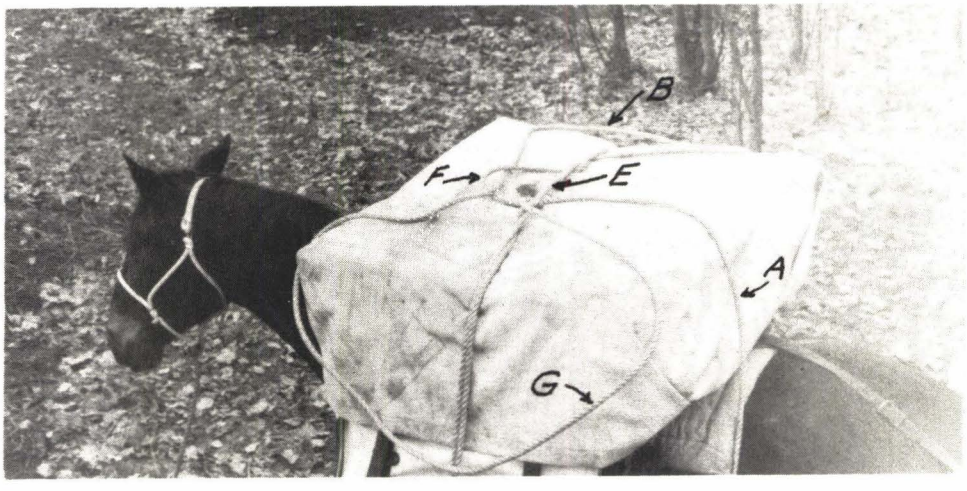


Fig. 15
Form Alforja Loops

Step 5: Grasp rope A at G (see figure 15) and pull out a loop as shown at G above. Half the required rope to make loop G comes each from B (the closed end) and A (the running end) of lash rope. This leaves a large loop B to go around the "off" alforja as shown.

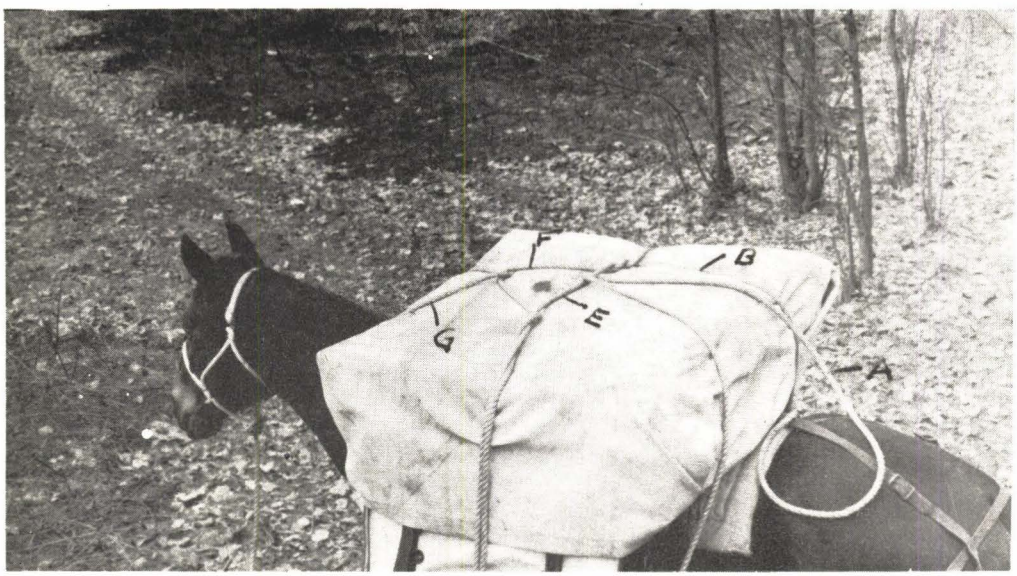


Fig. 16
Place Loops around Alforjas

Step 6: Go to "off" side and place loop B around and under the "off" alforja, pulling the slack out of loop F into loop B and tightening the rope around "off" alforja from the back to the front. In this process, the alforja should be lifted with the shoulder, back end first, then front end so that it will "ride" in the finished hitch.

Step 7: Holding the "off" side rope tight with the hand, pass to the "near" side under animal's neck. Pull loop G well forward to spread loop F as shown in figure 17. Tighten loop G around "near" alforja as described in step 6 but from front to rear.

Loops B and G should be placed about half way in on the bottom of alforja, so they will not slip off either on the inside or outside.

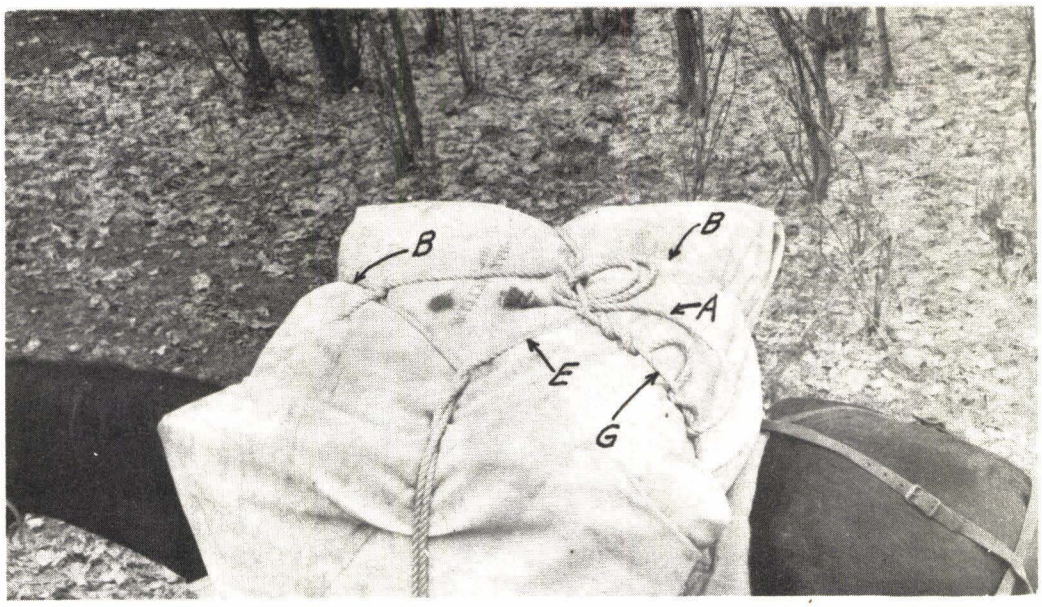


Fig. 17
The Final Tie

Step 8: Pull running end A until entire hitch is properly tightened, and tuck bight twice under rope G as shown in figure 17 to make secure. Other types of ties are in use, but this one is very satisfactory and can easily be untied with a pull on the running end A. Tying on top of the pack is considered better than on the cinch, since it can easily be untied even if the animal is mired or is down on its side. If surplus rope remains after completing the tie, it may be conveniently disposed of as shown in figure 17.

The lash rope shown is $\frac{1}{2}$" manila, 40 feet in length. Five-eighths inch lash rope holds better than $\frac{1}{2}$" where locking ties as shown are used. It also has the advantage of less stretch, does not cut into the packload so deeply, is easier on the hands in pulling, and lasts longer in use. Five-eighths inch manila is recommended.

On the Trail

Leading the pack string: Each animal in a pack string (except the first) should be tied to the saddle of the animal immediately in front of it with what is known as a "pigtail" tie. The pigtail is made by tying a small loop in the middle of a piece of $\frac{1}{4}$ inch or 3/8 inch rope, tying or splicing the ends of the rope to the rigging rings, and drawing

the loop through the rear fork of the saddle so it extends about 8 inches behind the saddle (figure 18). The pigtail, being made of small rope, will break under severe strain caused by a "pile-up." This method of tying will not disturb the pack load. The halter rope of the led horse should be long enough to give the led animal plenty of room, but not so long that the animal may get its foot over it.

Fig. 18 - "Pigtail" tie

Ordinarily loaded pack animals should not be turned loose on the trail, as this is likely to result in sore backs or other injuries from running to catch up, as well as loss of time in rounding up loose animals. It is sometimes desirable, however, to turn the animals loose, or to lead them individually, over a dangerous stretch of trail, so the slip of a single animal will not endanger the entire string and each animal will be less likely to slip. Should it become necessary to turn a pack string on a dangerous or narrow trail, each animal should be untied and turned around separately.

If an animal has the habit of pulling back, it should be placed at the front end of the string to permit direct control by the packer. This habit may be broken by using a draw halter. The packer should hold the halter rope of the first pack animal in his hand; never tie it around the saddle horn.

Speed on the trail: A loaded pack string cannot be expected to travel either fast or far. The usual pace on level trail is a normal walk, and an average speed on good mountain trail of two to three miles an hour

is reasonable. A sustained pack of twenty miles per day is a reasonably long pack especially if it is back country travel principally on grass feed. In back country travel, to allow the pack string ample time to feed, it is good practice to start early in the morning and go into camp the middle of the afternoon. Most packers prefer to travel straight through without making a midday stop. This eliminates the necessity of either throwing the packs or requiring the pack string to stand under load while the packer rests. The pack animal is doing the work and should be given the favors.

The speed of the pack string is set by the slowest animal and the packer should suit the pace of his saddle animal to a convenient speed for the slow pack animal. A loaded pack animal should not be "crowded" except in emergencies, especially when going downhill. Ample time should be given each animal to pick its way across or around such obstacles as logs, sharp switch-backs, and steep-sided ravines and creeks.

A good packer will always start his string slowly, looking back to make sure every animal is lined out with a loose rope, before going into a faster walk. Animals unexpectedly jerked in a quick start are likely to develop the habit of pulling back.

Rest periods: In climbing steep grades, especially at high altitudes, the pack string should be given frequent rest periods to "blow." These need not be longer than is necessary to prevent the animals from getting "winded" or exhausted. It doesn't hurt a horse to sweat, but no animal should be crowded to the point where the sweat drips off him freely and the leg muscles tremble, particularly at the beginning of a trip. The inexperienced packer can completely exhaust his pack string climbing the first grade and be forced to travel the remainder of the trip with tired animals.